What is claimed is:

1. A method of visualizing a vascular structure, said method comprising the steps of:

providing a digital image of a vascular structure wherein said image comprises a plurality of intensities corresponding to a domain of points in a D-dimensional space;

selecting a vascular central axis and a vector of interest in the image of the vascular structure, and forming a plurality of cross sections perpendicular to said vascular central axis;

forming a convex hull to enclose each cross section, wherein said convex hull is oriented by said vector of interest and determined by the shape of the cross section;

connecting each convex hull to form a biconvex slab; and

rendering said biconvex slab to form an image of said vascular structure.

2. The method of claim 1, wherein said rendering further comprises the steps of:

defining a viewing vector perpendicular to a plane containing the vector of interest and the vascular central axis;

forming a scan line through the vascular structure and along the vector of interest, wherein said scan line includes a left point, a center point, and a right point;

forming a square bounding box about the convex hull, wherein the intersection of each scan line with the bounding box defines a rendering range; and

emitting a ray through each pixel within the rendering range, wherein the rendering depth of the ray is within the maximum radius of the hull.

3. The method of claim 2, wherein said rendering further comprises the steps of:

estimating a ray that passes through the image, wherein said ray estimation is determined by said bounding box;

calculating an entry point and an exit point of the ray through the vascular structure in said image;

including a margin on each side of the bounding box; and

repeating said estimating step and calculating step to accumulate each volume contribution.

4. The method of claim 2, wherein said rendering further the steps of:

forming a contour from each said cross section;

projecting said contour along the viewing vector to the scan line to find a maximum forward depth and a maximum backward depth along the scan line;

including a margin on each side of the bounding box; and

repeating said projecting step to accumulate each volume contribution.

5. The method of claim 2, wherein said rendering further comprises a curved multi-planar reformation of the biconvex slab with rotation.

6. The method of claim 5, wherein the curved multi-planar reformation includes a modified maximum intensity projection.

7. The method of claim 5, wherein the curved multi-planar reformation includes a modified x-ray projection.

8. The method of claim 5, wherein the curved multi-planar reformation includes an adjustable diameter slab maximum intensity projection.

9. The method of claim 2, wherein said rendering further comprises a luminal multi-planar reformation on the biconvex slab with rotation.

10. The method of claim 2, wherein said rendering further comprises a luminal curved-planar reformation on the biconvex slab with rotation.

11. The method of claim 1, further comprising displaying in three-dimensional a double-oblique cross-sectional slab location.

12. The method of claim 1, further comprising the step of interactively rotating said image of said vascular structure in order to determine a viewing vector.

13. The method of claim 1, further comprising the step of interactively zooming-in or zooming-out said image of said vascular structure.

14. A method of visualizing a vascular structure, said method comprising the steps of:

providing a digital image of a vascular structure wherein said image comprises a plurality of intensities corresponding to a domain of points in a D-dimensional space;

selecting a vascular central axis and a vector of interest in the image of the vascular structure, and forming a plurality of cross sections perpendicular to said vascular central axis;

forming a convex hull to enclose each cross section, wherein said convex hull is oriented by said vector of interest and determined by the shape of the cross section;

connecting each convex hull to form a biconvex slab;

defining a viewing vector perpendicular to a plane containing the vector of interest and the vascular central axis;

forming a scan line through the vascular structure and along the vector of interest, wherein said scan line includes a left point, a center point, and a right point;

forming a square bounding box about the convex hull, wherein the intersection of each scan line with the bounding box defines a rendering range; and

emitting a ray through each pixel within the rendering range, wherein the rendering depth of the ray is within the maximum radius of the hull.

15. The method of claim 14, further comprising the steps of:

estimating a ray that passes through the image, wherein said ray estimation is determined by said bounding box;

calculating an entry point and an exit point of the ray through the vascular structure in said image;

including a margin on each side of the bounding box; and

repeating said estimating step and calculating step to accumulate each volume contribution.

16. The method of claim 14, further comprising the steps of:

forming a contour from each said cross section;

projecting said contour along the viewing vector to the scan line to find a maximum forward depth and a maximum backward depth along the scan line;

including a margin on each side of the bounding box; and

repeating said projecting step to accumulate each volume contribution.

17. A program storage device readable by a computer, tangibly embodying a program of instructions executable by the computer to perform the method steps for visualizing a vascular structure, said method comprising the steps of:

providing a digital image of a vascular structure wherein said image comprises a plurality of intensities corresponding to a domain of points in a D-dimensional space;

selecting a vascular central axis and a vector of interest in the image of the vascular structure, and forming a plurality of cross sections perpendicular to said vascular central axis;

forming a convex hull to enclose each cross section, wherein said convex hull is oriented by said vector of interest and determined by the shape of the cross section;

connecting each convex hull to form a biconvex slab; and

rendering said biconvex slab to form an image of said vascular structure.

18. The computer readable program storage device of claim 17, wherein said rendering further comprises the steps of:

defining a viewing vector perpendicular to a plane containing the vector of interest and the vascular central axis;

forming a scan line through the vascular structure and along the vector of interest, wherein said scan line includes a left point, a center point, and a right point;

forming a square bounding box about the convex hull, wherein the intersection of each scan line with the bounding box defines a rendering range; and

emitting a ray through each pixel within the rendering range, wherein the rendering depth of the ray is within the maximum radius of the hull.

19. The computer readable program storage device of claim 18, wherein said rendering further comprises the steps of:

estimating a ray that passes through the image, wherein said ray estimation is determined by said bounding box;

calculating an entry point and an exit point of the ray through the vascular structure in said image;

including a margin on each side of the bounding box; and

repeating said estimating step and calculating step to accumulate each volume contribution.

20. The computer readable program storage device of claim 18, wherein said rendering further comprises the steps of:

forming a contour from each said cross section;

projecting said contour along the viewing vector to the scan line to find a maximum forward depth and a maximum backward depth along the scan line;

including a margin on each side of the bounding box; and

repeating said projecting step to accumulate each volume contribution.

21. The computer readable program storage device of claim 18, wherein said rendering further comprises a curved multi-planar reformation of the biconvex slab with rotation.

22. The computer readable program storage device of claim 21, wherein the curved multi-planar reformation includes a modified maximum intensity projection.

23. The computer readable program storage device of claim 21, wherein the curved multi-planar reformation includes a modified x-ray projection.

24. The computer readable program storage device of claim 21, wherein the curved multi-planar reformation includes an adjustable diameter slab maximum intensity projection.

25. The computer readable program storage device of claim 18, wherein said rendering further comprises a luminal multi-planar reformation on the biconvex slab with rotation.

26. The computer readable program storage device of claim 18, wherein said rendering further comprises a luminal curved-planar reformation on the biconvex slab with rotation.

27. The computer readable program storage device of claim 17, the method further comprising displaying in three-dimensional a double-oblique cross-sectional slab location.

28. The computer readable program storage device of claim 17, the method further comprising the step of interactively rotating said image of said vascular structure in order to determine a viewing vector.

29. The computer readable program storage device of claim 17, the method further comprising the step of interactively zooming-in or zooming-out said image of said vascular structure.